

Oral and Personal Histories of Computing at Cornell

Dominic Bordonaro Recollections, 1948 - 1968

In 1948 I was fresh out of high school and looking for work. Day Hall had been built in 1947 and the basement, which had wide-open spaces, was where Personnel and Machine Records were located. Personnel later moved to Ives Hall. I was hired on the spot by Bob Burghardt, who was the first manager. Bob worked for the Registrar at the time, Ernie Whitworth.

In those early days, the reporting channel for Data Processing (DP) was not clear. DP reported to Personnel, to the Registrar, and to Purchasing at different times. At one time the Machine Records (MR) unit reported to both Deid Willers in Personnel and Wally Rogers in Purchasing.

In 1955, I negotiated with Willers to stay on at Cornell only because that same year, Arthur. H. (Art) Peterson, Controller of the Statutory Colleges was appointed University Controller and Machine Records was going to report to him. Peterson appointed me Director of MR. In the period between Bob Burghardt's leaving and my appointment, there were 6 directors, some of whom stayed less than 6 months and left. One only stayed 3 weeks!

The Statutory DP shop came about in 1955 or so when Lloyd Slater was the chief financial officer for the State Campus. Prior to that time, the State Business Office was a large customer of MR doing work in Payroll and Accounting and Inventory for example. Later when Stewart Comber moved over to SBO he beefed up their operation first installing keypunches, then a sorter, followed by a tabulator and in the early 1960s, the IBM 305 Ramac.

The Ag Ec shop, under Onnie Zaharis, did its own thing, largely for that department. MR got work that they turned down.

Machine Records serviced about 60 to 70 departments on a fee for service arrangement doing mostly small tab work. This was about the mid 1950s when Art Peterson became Controller. From that time, I reported to him much like the Print Shop, WHCU, Residential Halls, Campus Store and other Auxiliary Services. These operations grew to the degree income could sustain expenses and someone was asking for the work and willing to pay.

When I came in 1948, I knew very little about written procedures. I started as a clerk,

delivering grade cards on foot around the campus and then picking them up to do midterm and final grades. I did all that stuff. I was in charge of bursting reports, delivering them, etc. but tired of all this work and moved on to become an operator. At that time, everything about the job was in your head. You knew what you were doing but there was nothing written down.

As Directors came and went, I can't even remember them, but I recall the names of Roger Gettings who stayed for 3 weeks and Stan Gill who stayed for awhile. I kept hanging on hoping things would get better. In 1955 when I came close to quitting, I became Director and the operation started to grow and develop processes and procedures. We did all kinds of work for all kinds of divisions.

I left Cornell in July 1968 and went off as Director of Systems and Data Processing at Ithaca College.

Comments about the Merger to form OCS in the period from 1965 to 1968.

MR had a beefed up 1401 just prior to the merger and couldn't expand it any further so I had ordered an IBM 360/40 with disks. Later I expected to install remote terminals using IBM software. By this time, MR had moved from 1401 Autocoder to Cobol. Cobol compilers were not very good but what the heck! Conway cancelled the 360/40 over my objections since I wanted proof that the 360/67 could service this need. My argument was that if the merger and the 360/67 didn't work then we would be 2 years behind since all other work would have to stop in the interim.

The 1401 and all staff moved to Langmuir and as you know, the 360/67 never was installed. Two 360/40s were installed as test machines in preparation for the 360/67 but these were not used for servicing work. Conway's plan was to convert the applications, just like that, from Autocoder to Cobol, which was the direction at the time, and then to develop new applications. However, the conversions (and tools) were not very good, way below the 90% compatibility expected, and lots of rework was needed. Eventually the plan was to rewrite the applications but conversion was the first priority. Promises had been made to converting Alumni Records and we wanted them on line with terminals since they both were a simple record keeping operation and could easily update and examine files. They were going nuts but the conversions never came off and it was a nightmare.

The way Conway wanted to run things was to have my staff design and write programs and OCS Operations Staff would do the running. However, the Ops Staff under Dave Pulleyn didn't know much about customer hand holding and there were numerous problems running jobs. The administrative people would come to our door and drop the materials off and we had to run the job and deliver it back to them. The Operations people claimed they didn't have procedures but they did have JCL streams and some documentation. Job after job got butchered. (You are the second person to repeat the episode about 10,000 blank grade reports, on 4 part form no less, when Operations did not execute properly! They forgot to mark read the grades into the grade cards prior to running the grade reports). After several months of such problems, Conway asked me to take back all the old MR staff and go back to the old ways for 4 months during which we would document procedures and train the Operations staff. When everything was working well, the new arrangements would be put back into place. Basically, apart from a few minor mistakes, things worked well after that. What got lost in the shuffle here was the plan to put more applications online. That really hurt. The 360/67 never came and communications on the 360/65 were not good.

Worley and the other guys were absolutely convinced they could rewrite and improve anything IBM did. They never understood the effort and commitment it took to go through new releases and upgrades but by that time they got bored and wanted to go off and do something else new.

Comments about Key Players in Machine Records, and other units

Gerry Buckland was Operations Manager. Joined about the time we went to the 1401. He was the main operator and Ops Manager too. Went to IC before me to be Ops Manager there.

Ruth DeLong was the Data Entry Supervisor who left Cornell at about the time of the merger.

Irene Van Zile started as a Keypunch Operator, became a Computer Operator and was the assistant Ops Manager to Gerry Buckland just prior to the merger. Irene filled in for DeLong, as she had done many times in the past. Irene was versatile and had the experience to take on the merged Data Entry function.

Charlie Evans was Manager of Systems Programming. Charlie started as a 1401 programmer but worked up to be a Systems Analyst, doing most of the new systems designs.

The basic organization was 3 people reporting to me, Gerry, Charlie and Ruth DeLong

I recall hiring Ed Hollenbeck as an analyst sometimes around 1966-67, and by that time we had about 8 to 10 analysts and an equal number of programmers.

In the Statutory Business Office, Bob Walsh replaced Slater. Paul Kilby was the perennial second in command.

Jim Truesdale was an old reliable hand in the Accounting Office

CAUSE and CUMREC

CAUSE - College and University Systems Exchange Organization

CUMREC - College and University Machine Records Organization

CAUSE was an outgrowth of CUMREC and I was one of the Founding Members serving

on the Board of CAUSE for 7 years. I served a term as president of CUMREC and chaired the conference held in London, Ontario.

Some Thoughts about Machine Records

With the advent of personal computer and software systems, today's users have become more directly involved in the development and operation of their office processing systems. Some 40 - 50 years ago the relationship between users and the hardware was entirely different.

The Machine Records Division (MR) of Cornell University, also referred to as "tabulating shop", was the operational arm of the University's data processing effort. Unit Record equipment was far too large and expensive for departments to rent on their own (then, it wasn't for sale). The MR unit was established to assist various departments with this work, where the costs could be justified. In an attempt to recover its costs, MR was forced to charge an hourly rate for each piece of equipment used to complete a job. Time cards were punched in/out on a time clock, as the job progressed. Department charges were prepared monthly.

In those early days, tabulating was viewed as an interesting way to accomplish certain tasks, but rarely did anyone rush to mechanize their operation. As the University began to grow, so did the tasks, particularly in offices such as the Registrar, Personnel/Payroll, and Accounting. These were the first offices to utilize MR service. There was always the fear that they, the user, would lose some control over the operation, so some applications were slow to develop.

The user was forced to rely heavily on MR for the development of any application, for the development process was rather complex and involved a great number of sequential steps. Record (card) formats had to be designed, proofed and printed at IBM - MR purchased all cards and was also responsible for maintaining the inventory. This was also done with printed forms, checks, etc., - these forms were purchased from various continuous forms vendors - such as Moore Business Forms, Standard Register, etc. There were hundreds of forms and card types to inventory.

With the development of each application, procedures and flowcharts had to be developed. Control panels for each piece of equipment had to be diagrammed and hand wired, tested, and stored for later use. As the design phase was completed it was assigned to one of the MR operations staff. When even minor changes were needed, it involved a multiplicity of tasks to complete - cards and forms needed to be modified, reordered and inventoried. Control panels had to be modified or rewired. Procedures had to be modified or reprinted.

The MR staff was organized into three groups. 1. Data Entry. 2. Operations. 3) Systems and Procedures. The Data Entry or Keypunch Group was responsible for transcribing data to punched cards. This was done via printed and hand written lists. Changes to already punched cards was more involved since the original card had to be located in the files, pulled out for duplication or correction. These changes were then interpreted and

proofed, then refiled back into the drawers of cards stored at MR. Card file storage, incidentally, became a serious space problem because eventually the cards numbered into the millions.

The Operations staff consisted of several operators. Each operator was assigned responsibility to particular jobs on particular schedules. Some of these schedules varied from daily, weekly, monthly, term and annually. There were situations where the work load for completing a particular task was too great for the operator. In these cases, others were directed to assist, including, at times, a keypunch operator or two. These operators became an adjunct to the office whose work they were responsible for. They were in daily contact with the users and were often times invited to department meetings. This helped greatly with communications and helped to reduce the number of misunderstandings that could easily occur. This structure had many advantages due to the job knowledge an operator could develop. The main disadvantage was seen during vacation/illness. Operations personnel, like anyone else, do not write down each and every detail, where it deviates from the procedure as written. During these situations we had to walk another operator through the steps very carefully and often with the department representative alongside. We surveyed a great number of other tab shops and could not find a better method, at least without having to hire several additional people. Even with its problems, this method gave us the highest degree of production, with the fewest errors/reruns/problems than any other method we could afford.

As the process was computerized, processing steps were vastly reduced. This began to give more control over the job and more flexibility over the operations staff. Administrative Data Processing has a very small margin for error - you can't always "just do it over". After all, payroll checks/registers/etc. are available in a finite quantity - not to mention the associated costs for mistakes. We never missed a payroll and shudder to think what might have happened if we had.

Computer systems have shifted the responsibility to the user, which is the way it should be. Computers, however, have not eliminated the possibility of human error or scheduling error, and best of all, departments have to order and inventory their own forms.

I tried to recall some of the work we did with unit record equipment. I've appended a partial list of jobs, but my memory is not as sharp as it was.

Machine Records Partial Job List (Bolded Jobs were done between 1948 and 1956)

- Admissions Office
 - Statistical Reporting and Predictions Data
 - Applicant Processing
 - List Processing
 - Mailing Labels, etc.

• Financial Aid

• Applicant Processing

- Scholarship lists
- Accounting/Distributions
- Statistical Reporting
- Government Reporting
- Treasurer's Office
 - Student tuition/fee Billing
 - Income distribution/reporting
 - Statistical reporting
- <u>Registrar's Office Fall/Spring/Summer Terms</u>
 - Student Matriculation Listings
 - Record Creation Statistical Information
 - List Processing Rosters
 - Course File Creations/Lists
 - General Student Registration
 - Course Selection/Registration/class listings
 - Mid-term Grade Processing/Reporting
 - Student Transcript Posting
 - Final Grade Processing/Reporting
 - Course Scheduling/Room Schedules
 - Term Statistical Analysis
 - Exam Scheduling and Conflict Lists
- <u>Alumni Relations/Development Office</u>
 - Alumni Class Listings
 - Directories
 - Mailing Labels/Lists/Envelopes
 - Gift Accounting and Reporting
 - Campaign support/reports
 - Reunion support/lists
 - Statistical Analyses
- <u>Personnel Office</u>
 - Applicant Records
 - Employee Reporting
 - Fringe Benefit Reporting
 - Statistical Reporting

• Endowed Payroll Office

- Semi-monthly payroll processing
- Employee Earnings Records annual posting
- Y-t-d summary reporting monthly
- Annual W2 Processing mailing
- Statistical Reporting
- Hourly Payrolls Weekly and Bi-weekly (checks/registers)
- Quarterly/Annual Government reporting tax/FICA

• Listings/Department - for reconciliation

<u>General Accounting Office and Budget Office</u>

- Accounting Expense Ledgers
- Check Writing and Registers
- Journal Reports
- File Maintenance
- List processing expense categories
- Departmental Budget creation
- Budget Reports and Analysis
- General Accounting Reports (income/expense)
- Expense Ledgers
- Bank Statement Reconciliations
- Telephone Toll accounting
- Departmental Phone Bills and Journals

• NYS Business Office

- Statutory College Payroll files (establish/maintain)
- NY County Agents Payroll files (establish/maintain)
- Check and Register Preparation
- NYS Reporting Monthly/Quarterly/Annual
- W2 preparation/mailings
- Bank Reconciliations
- Earnings Records posting
- Departmental Reporting monthly
- Capital Equipment Inventories/reporting
- Statutory College Budget Preparation and Reporting
- Purchasing Office
 - Vendor file preparation/maintenance listing
 - Purchase Orders and Reports
 - Local Pickup Orders
 - Capital Equipment Inventories
 - Department Charges Journals

• **Buildings and Grounds Division**

- Daily Job Cost Accounting
- Daily Labor/Material/Overhead reporting
- Job Status Reporting
- **Project Billings**
- Weekly Hourly Payroll preparations
- General Accounting Preparation
- List Processing

- <u>General Stores General/Electronic/Chemical</u>
 - Perpetual Inventory Records
 - Inventory Catalogs and Price Lists
 - Daily Departmental Invoices
 - Monthly Physical Inventory Lists
 - Materials Inventory record posting (history)
 - Profit/Loss Statements

In addition, we serviced several departments on a more infrequent schedule. These were:

- Physics Department Aurora Borealis
- Sociology and Anthropology Statistics
- Artificial Breeders/Animal Husbandry
- Hotel School Hotel Systems research
- Safety Division Traffic Tickets
- Athletic Department Rosters/Labels
- ROTC lists/mailings
- (Others I can't remember)

Transcript of Written Notes

(undated but probably in mid 1960s, corrected May 1998)

Late 1946 University installed a small unit to process student records and basic payroll preparation:

2 punches, 1 verifier, 1 sorter, collator, interpreter, 405 tabulator

Responsibility for this unit came under Registrar; Bob Burghardt Manager Grew like a weed - wild - no particular direction planned

Unit grew some until 1951-52 with some success. Operation - equipment - was small and simple

Bordonaro (who started in 1948) left in December 1950 for a stint with the US Air Force. Returned November 1963. (Also finished some of the work I left in the Sorter Rack in 1950 - Admissions Statistics)

One supervisor and 5 personnel - budget \$35,000.

2 405, 2 - sorters, 1 collator, repro, 3 punch, 1 interpreter, 1-602A Calculator

1952-53 saw problems - no supervision or written procedures; Catastrophe - no real progress made until 1956-67 under new direction of Controller - Reorganize - Expand - Procedures - Schedules - etc.

(Keypunches, verifiers, interpreters, collators, calculators are not mentioned below since they were basic to all operations)

1952 2 - 405 1953 1 - 403 1 - 402 2 - 082 sorters 1954 2 - 403 1 - 402 3 - 082 sorters

1955 1 - 407 1 - 403 1956 2 - 407 1 - 528 1 - 083 1 - 082

(Note IBM 528 is a Reproducing Summary Punch with arithmetic counters).

1957 2 - 407 1 - 519 2 - 083

1958 2 - 407 1 - 408 with Bill feed 1-604 Calculating Punch

- 1960 ordered 1401 card system
- 1961 ordered 1401 Ramac
- 1961 ordered 1401 Tape Ramac
- 1961 remodeled installation for Computer Basement of Day Hall.

Install Mgmt Prog; policies, planning, organize, motivate, control Today at 24 people, \$250,000 (budget) Served 20 departments, 200-250 jobs, 500 to 300,000 (cards per job)

All work done on a cost basis (est) Work request made - est - sched

1946 small installation planned for student records and payroll (location unknown?) One supervisor and one operator started More and more work was undertaken on fee basis to offset cost of operations This started a vicious cycle

CPC went in end 1953 at Computing Center 46-47 State Payroll Pilot Program 47-48 State Payroll Main P/R process

Equipment (\$500 / mo) delivered October 46

Student Registration and Payrolls 1948 Admissions Pilot 1956 - 27 departments, 150 jobs, 100 to 100,000 cards 1946 - 1952 Turnover problem 23 people, 10 men, 13 women Today turnover no problem

1946	Supervisor + 1 operator
1947	Supervisor + 2 operators
1948	Supervisor + 4 operators
1949-1953	Supervisor + 6 operators
1948-1954	Slow growth, but poor planning - supervision
1953-54	Budget \$43,000, 7 people
1956-57	Growth program was started
1959-1960	12 people, \$145,000
1960-1961	20 people, \$166,000 (added data prep and programming staff)
1961-1962	20 people, \$180,000
1962-1963	24 people, \$250,000

1963-1964 26 people, \$275,000

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